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ABSTRACTS

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Tuberculosis in War.—The author considers tuberculosis mortality as a social barometer. The actively tuberculous population is very sensitive to environmental changes, such as periods of unusually cold weather, industrial depression, increased crowding due to various causes, shortage of certain foods, enhanced stress of living conditions produced by war, and even, it seems likely, to psychological stresses affecting large bodies of people. In the present war, so far, the English have experienced the initial wave due to hastened deaths of the already tuberculous and, starting rather late, a wave due to fresh meningitic infections. Studying the statistics starting from the year 1924, it is noted that the crude death rates were falling by about 4 per cent annually during the immediate pre-war period. Figuring the expected death rates for respiratory tuberculosis on this basis and comparing them with the actual figures of the war years we find that in 1939 there was an excess of 802 deaths; in 1940, 3,750; in 1941 about 4,500 and in the first half of 1942 about 1,900. It may be estimated, therefore, that a total excess of some 8,000 deaths from respiratory tuberculosis is attributable, so far, to the war. The increase was relatively greatest among children under fifteen; men of thirty-five to forty-four and women of twenty to twenty-four. The same trend is noted in deaths from tuberculosis of the meninges, central nervous system and other sites. For all forms of tuberculosis the cost of the war up to mid-1942 may thus be estimated at about 11,000 deaths, and the initial waves of respiratory and meningeal tuberculosis deaths seem now to be rapidly declining. But the improvement which was to be expected from the normal downward trend of the pre-war period has yet to be overtaken, and a secondary, perhaps more lasting, wave may yet appear as a delayed result of the increased incidence in active disease of the respiratory form which is believed to have occurred in 1940–1941.—*Tuberculosis Deaths and the War, P. Stocks, Brit. M. J., December 26, 1942, 2: 750.*—(*D. H. C.*)

Methods for Mass Survey of Chest.—It is agreed that everyone entering military service should have a roentgen examination of the chest. There is, however, no general agreement as to the type of examination which should be adopted as indicated by the fact that the Canadian Army has used the 14 x 17 inch film, the United States Army has adopted the fluorographic method with 4 x 5 inch film, and the United States Navy the fluorographic method with 35 mm. film, and that 14 x 17 inch paper film has been used on examination of a large number of selectees and has strong advocates. The 14 x 17 inch film method is the best. It is most accurate in diagnostic detail and is the only method which should be employed for accurate diagnosis of type and extent of disease and for careful comparative study of the progress of disease. The disadvantages of the 14 x 17 inch film method are its cost, relative slowness in operation and difficulty of filing and preserving films of such large size. The three methods which may properly be called "survey methods" are the roentgenographic paper method of the Powers Company, and the

fluorographic methods with 4 x 5 inch and 35 mm. film. The paper method has been employed in surveys of school children and its value has been thoroughly demonstrated. It has not been considered practical for use in the military service. In civilian surveys the method has made use of paper in rolls which is very convenient for making the exposures, but for the military it is necessary to have the films separate for each individual. The objection to the size 14 x 17 inch is the same as that for the large film. The advantages of the 4 x 5 inch film are the relatively low cost, the speed of operation (about 60 exposures per hour), readability without enlargement and low storage requirement; furthermore, the film may be filed directly with the patient's record. The disadvantage is the high cost of the original photographic equipment which is in addition to the roentgen apparatus which must be capable of at least 200 ma. output. The advantages of the 35 mm. film are the minimal expense (one-fiftieth that of 14 x 17 inch film), high speed of operation (about 150 per hour), ease and convenience of storage. The disadvantages are that projection or magnification is required for reading the film and that it is less convenient for filing with the patient's record. Of the survey methods, the 4 x 5 inch method is the best; in diagnostic accuracy, it is rated very close to the 14 x 17 inch film. In fact, for the detection of minimal tuberculous lesions, a stereoscopic pair of 4 x 5 inch films is preferable to a single 14 x 17 inch film. The U.S. Army Medical Department now has its films made in the 4 x 10 inch instead of the 4 x 5 inch sizes so that two fluoro-roentgenograms are made in each case and are readily examined stereoscopically.—*Evaluation of Methods for Mass Survey of the Chest, A. C. Christie, Am. J. Roentgenol., January, 1942, 47: 76.*—(*W. H. M.*)

Fluorography of Chest.—In recent years the increasing demand for mass radiographic surveys and a search for simple and less costly methods have operated to establish photofluorography as an acceptable and useful auxiliary method of chest X-ray examination. The most desirable method of examination—preliminary fluoroscopy, stereoscopic film and, where indicated, more elaborate studies—is not supplanted but rather augmented by adding patients who otherwise might be missed. Because of photofluorography's short-comings it is imperative that it be left in the hands of trained physicians. This can best be done by applying mass X-ray chest survey methods to hospital and clinic. Where standard size stereoscopic films are obtained routinely, the method has nothing to offer but economy, but where chest X-ray studies are made only because of clinical suspicions, the usefulness of the roentgenologist will greatly increase. Two basic types of apparatus are procurable, the fluorescent screen supplied with apparatus using the 35 mm. strip film, and a screen of the fluorazure type employing 3 x 5 inch cut film. Where cost is of prime importance, the 35 mm. film holds the advantage, but for films to be viewed directly, the 4 x 5 inch is much more preferable. However, the ultimate decision should rest on the program contemplated. The complexity of the problem has been further increased by the recent perfection of attachments for stereoscopy and it is doubtful whether any radiologist after viewing miniature stereoscopic films will be completely satisfied with the single projection. In order to serve its fullest purpose as a screening device, miniature films should be obtained of every person when first registered and the results made available with the minimum delay. Thus the chest filming station will usually be at some distance from the regular X-ray centre. Other problems to be met are the supplying of suitable high-capacity power, twenty-four hour service, making individual and accumulated group records easily available and the consolidation of each day's work. All require thoughtful planning for smooth dependable operation of the program. The routine chest filming of University of Michigan students during the past seven years has amply proved its worth and is a firmly established procedure

for all hospital employees. A two week trial period filming all registering patients left no question as to the value or feasibility of the venture. The regular use of this for all persons registering in the hospital was made possible from funds from the W. K. Kellog Foundation and the aid of the University Physics Department. Difficulties were met in obtaining satisfactory equipment which now is available. Significant difficulties also arise in establishing a routine admission chest filming program. One of the first is obtaining complete coverage of all patients including the critically ill, emergency and the private cases registering by proxy. The services of a full-time trained technician able to position and film all patients enabled a maximum of 100 persons per hour to be cared for. Film processing required a part-time technician working on an average of two hours a day. The results of the filming could be interpreted without delay in about twenty minutes, but all films are read in the afternoon for a previous twenty-four hour period when the registrations are slack. Reports of obvious or suspicious findings of clinical significance are sent directly to the division in which the patient registered. Reports of the entire period are consolidated and sent to each clinical division each morning. To facilitate reporting a special blank was prepared in ballot form, also classifying patients as to (*1*) negative chest, (*2*) abnormal chest, no further X-ray examination recommended, and (*3*) abnormal chest, further X-ray examination recommended. Space is available to note the type of examination desired. After instituting the photofluorographic examination of all patients in July, 1941, 7,841 were examined in the first four months. Seventy-four per cent were classified as negative, 14.1 per cent were thought to have abnormalities of no significance and further study was recommended in 9.3 per cent or 732 persons. In one month 204 patients were recommended for more thorough examination and 163 were examined as suggested. A pulmonary lesion originally reported in 69 was confirmed in 51 and some condition other than pulmonary disease was found in 13. The survey plan is not infallible in tracking down obscure conditions, but is designed to help in establishing a final diagnosis. Intelligently used it is probably most effective in identifying open advanced cases of pulmonary tuberculosis. To condemn the photofluorography for inability to establish definite evidence of early tuberculous lesions is to overlook the fact that it can be used more often than standard procedures and is analogous to routine urine and serologic tests. Signs of pulmonary disease are found in 8 to 10 per cent while positive serologic tests are found in about 2 per cent of all patients.—*Fluorographic Examination of the Chest as a Routine Hospital Procedure, F. J. Hodges, Radiology, April 1, 1942, 38: 453.*—(*G. F. M.*)

Photoroentgenography.—The ideal miniature chest film while much smaller than a direct roentgenogram (the area of the 4 x 5 inch film is about fifteen times the area of the 35 mm. film and one-twelfth the area of the 14 x 17 inch film) should be large enough to serve exactly in its stead and simple to read, file and review. This ideal has been approximated but not absolutely reached. The present fluorographic screens are "speed" screens but require relatively large crystals of the sensitive salt which tend to dull the details of the normal fine hair-line lung structure; fortunately the minimal lesions of tuberculosis are nodular or irregular and their images are less influenced than those of the vascular radicles. If greater lens or film speed should be developed, smaller crystals could be used in fluorographic screens. The recording film must be color sensitive to the fluorescence of the greenish zinc cadmium sulphide or the bluish zinc sulphide screens. Since 1937 the Eastman Company has been producing the Blue Brand duplitized film and, recently, another film with a complex single emulsion which tests out even better in certain respects. An important aspect of miniatures is that of film grain; the faster the emulsion the larger the little silver granules

which are not ordinarily detectable in films until they are enlarged. In 4 x 5 inch miniatures there is no grain problem and the film can be read directly. When the smaller sized films are used, reënlargement is needed and the grain problem appears; furthermore, detail loss from light dispersion occurs when reënlargement of more than two and one-half diameters is used. The other primary and important factor in speed fluorography is the lens. Bausch and Lomb have produced a large lens specifically adapted to fluorography. It has a 6 inch focal length and 3 inch aperture, belongs to the anastigmatic series and is corrected for all objectionable aberrations. It gives good definition over a wide field of coverage and is *unusually* large for its speed. Rated optically at f:2.0 it has been speeded up by the application of the very new coating of monomolecular films on the eight air-to-glass surfaces, reducing light reflections and increasing light transmission, thus making it the equivalent of an ordinary uncoated f:1.5 lens. A fine grid diaphragm is now being applied to fluorography. The stereoscopic principle is also being used to considerable advantage in fluorography. The stereoscopic shift occasionally prevents small flecks of tuberculous areas from being overshadowed and obscured by an overlying rib. A 4 x 10 inch film holder and a small stereoscope are available. The use of films in rolls seems rather advisable for the very small miniatures but the single exposure film holder is preferred for the larger sizes. Since fluorography is intended to be used by those who require large numbers of chest films each day, the original expense of the apparatus is soon absorbed by the saving in films and chemicals. Because of the proved diagnostic superiority of the 4 x 5 inch film, tuberculosis survey men may not have to differentiate between one cent for a 35 mm. film and five cents for a 4 x 5 inch film. Regular sized films are advocated for more detailed study of the positive cases, to periodically check their progress and to help determine the special treatment for each.—*Technical Factors Underlying Miniature Roentgenography of the Chest, H. L. Potter, Am. J. Roentgenol., January, 1942, 47: 71*:—(*W. H. M.*)

Body Section Roentgenography.—Body section roentgenography (planigraphy) gives visual information that is not obtained by any other type of roentgen information, particularly in the respiratory tract where indications for its use are more numerous than elsewhere in the body. Disease processes in the lungs that cannot be visualized by conventional roentgen studies, because of adjacent atelectatic lung, pleural fluid or some other dense tissue, are frequently made apparent by planigraphy. Results have been more spectacular with lung tumors and tuberculous cavities than with any other abnormality. Not only is the shadow of a tumor differentiated from that produced by surrounding dense lung tissue, but the neoplasm is sharply localized so that aspiration biopsy is feasible. If the tumor arises in one of the major bronchial divisions, the resultant narrowing or occlusion of the bronchus is demonstrable although the tumor itself may be better visualized on a roentgenogram exposed at slightly different depth than the one that shows the deformed bronchus. Such a finding indicates existence of the major portion of the growth outside the bronchial lumen. The value of planigraphy to demonstrate tuberculous and nontuberculous lung cavities is becoming well known. Provided the examination is done thoroughly, with proper technique, negative findings are reliable and therefore the method is as valuable to rule out cavitation as it is to establish the presence of a cavity. Tracheal stenosis, bronchiectasis or distortion of the tracheobronchial tree due to any cause is made apparent even in the presence of dense neighborhood structures. Foreign bodies in the lungs that are sufficiently dense to cast a shadow only on ventral or dorsal projections but not on lateral projections are localized by body section roentgenograms. The experience of the author includes accurate localization of a deciduous tooth that could not be visualized by lateral projections due to

resultant abnormal density from the foreign body atelectasis. Since the depth of the anteroposterior planigraphic section that showed the foreign body was recorded, it was easy to determine the relation of the tooth to the anterior and posterior aspects of the lung, and thus ascertain which bronchial branch harbored it. Before the examination, it was impossible to locate the foreign body bronchoscopically, but bronchoscopic removal followed this planigraphic localization.—*The Value of Body Section Roentgenography (Planigraphy) for the Demonstration of Tumors, Non-Neoplastic Disease and Foreign Bodies in the Neck and Chest, B. R. Young, Am. J. Roentgenol., January, 1942, 47: 83.*—(*W. H. M.*)

Surveys of Chest.—Almost as soon as recruiting for the Army was started in Canada, the medical examination included a chest roentgenogram, using a single 14 x 17 inch film. The purpose of the roentgen examination is to exclude carriers of tuberculosis capable of infecting others, to avoid the breakdown of enlisted men in whom there are unsuspected pulmonary lesions and to protect the country from huge expenses caused by hospitalization and pensions. At the onset civilian roentgenologists were paid $2.00 per case; they supplied the film and envelope and did the developing. Report forms were supplied by the government. At the present time the civilian roentgenologists have been largely replaced by military medical officers at various camps or hospitals. Ontario has a very active and efficient tuberculosis prevention department which has calculated that it costs approximately $500.00 to find each case of tuberculosis; it costs about $1,000.00 to treat each case of minimal tuberculosis, $3,000.00 for each moderately advanced case, $5,000.00 for each advanced case. In the case of an enlisted soldier who develops tuberculosis the expense is tremendously increased since it includes hospitalization, a pension for life and usually a living allowance for his wife and family. In Canada following the previous war, this amounted to an average of about $25,000.00 per case. Nontuberculous pulmonary infections have received too little attention. In the Army nontuberculous infections can be quite as crippling in their effects as tuberculosis, and the cost for hospitalization and pensions is from four to six times that for tuberculosis. Figures from the Director General's office indicate that during one period of recruiting 328,325 men were examined by the single 14 x 17 inch film method and, of these, 5,273, or 1.6 per cent, were rejected—3,076 for tuberculosis, 1,088 for nontuberculous pulmonary disease and the balance for cardiac or other conditions. This investment of some $600,000.00 for the roentgen survey has resulted in a saving to the country of over $20,000,000.00. Stereoscopic examination of the lungs is preferable to single film examinations. Although the author has had no experience with the 4 x 5 inch method, he considers the stereoscopic application of the 4 x 5 inch film to be ideal in mass surveys. Up to the end of May, 1941, 895 men were discharged from the Canadian Army because of pulmonary tuberculosis. Most of them had been recruited before chest survey roentgenograms were routine. In reviewing the roentgenograms of the 328,325 recruits, 27 known errors were detected; of these, 11 were "personal" errors in interpretation and therefore presumably avoidable, while 16 were considered inherent in the method and unavoidable. Even if others were discovered later, as will probably happen, the use of single 14 x 17 inch films has proved to be highly accurate as a means of discovery of tuberculosis carriers and amply justified on economic grounds.—*A Discussion on Surveys of the Chest, G. E. Richards, Am. J. Roentgenol., January, 1942, 47: 66.*—(*W. H. M.*)

Group Examinations.—The film usually accounts for 20 per cent of the cost of an X-ray examination but this is not true when large numbers are examined at one time. Recruits were examined at the Los Angeles Induction Centre with 14 x 17 inch films in such a way

that much time consuming manoeuvres were eliminated. The men were stripped to the waist, lined up in such a way that the first 6 could observe the examination of those preceding and the man at the head of the line was in a place where he could see the position of his predecessor. Thus with one technician measuring the chest and setting the kilo-voltage and another changing the film and positioning the patient, 300 or more were examined daily. Two men worked in the dark room and three cassettes only were needed. Safety boxes holding eight hangers were employed so that lights could be turned on if necessary. Films were developed in a ten gallon tank on a time-temperature basis, fixing time was five minutes and each of two cascade washings took five minutes. The developing room was seldom overloaded. Films were transported on hangers in frames of eight to the drying rooms. Interpretive reading was simplified by the use of the Army Medical Standard recommendation as to size of calcifications and lesions and standard descriptions, couched in language such as could be understood by any clerk, were used. Thus, full-size films of good diagnostic quality without skilled technicians and using regular stenographers were obtained as rapidly as any method using small size films or paper.—*A Technic for Chest X-ray Examinations of Large Groups, W. Bailey, Radiology, September, 1942, 39: 306.—(G. F. M.)*

Tuberculosis Control.—A method is suggested for the control of tuberculosis in a mental disease hospital during the economic exigencies of wartime. The mortality rate from pulmonary tuberculosis among psychotic patients has been very high and increasing steadily. Due to the expense of universal hospital roentgenography and the scarcity of material a new scheme was evolved for controlling tuberculosis. The erythrocyte sedimentation rate of about 1,100 patients was measured and those with a reading over 14 mm. per hour were radiographed unless another cause was found for the elevated rate. Whenever the sedimentation rate measured between 7 to 14 mm. per hour, the test was repeated a few weeks later in order to study the direction of the sedimentation rate. Of 385 roentgen films so made, 90 showed active lesions and 26 were considered to be suspicious. These 116 cases were treated as cases of pulmonary tuberculosis and their activity studied by repeated determinations of the sedimentation rate at monthly intervals. It was found to be a good method for detecting activity in the mental disease hospital where many of the cases are stuporous, mute and uncoöperative.—*Control of Pulmonary Tuberculosis in Mental Hospitals, W. P. Berrington & C. E. Greenwood, Lancet, December 26, 1942, 2: 752.—(J. B.)*

Pulmonary Tuberculosis in India.—The roentgenological findings in 973 patients treated at the R. B. Amarnath Tuberculosis Institute, Mayo Hospital, Lahore, from January 1, 1940 to June 30, 1942 are analyzed. Among these cases, 633 (65 per cent) showed predominantly exudative lesions, while 216 (22.2 per cent) showed predominantly proliferative lesions. Miliary spread in the lungs was demonstrable in 18 (1.9 per cent); 106 (10.9 per cent) showed involvement of the pleura only. Previously healed lesions were found in 212 (21.8 per cent). Unilateral disease was found in 305 (31.3 per cent). Three hundred and ninety (40.1 per cent) of the patients showed cavitation, 215 (55.1 per cent) of these showing a single cavity and 175 (44.9 per cent) showing more than one cavity. Tuberculosis among Indians is predominantly acute in type. The Indians have a good resistance to childhood primary infection. The acute course of the disease is supposed to be due to the poor economic conditions and to the low hygienic standards.—*Types of Pulmonary Tuberculosis Found in Different Communities, with Some Observations Made in Northern India, R. A. Shah, Indian M. Gaz., October, 1942, 77: 620.—(G. C. L.)*

Constitution and Tuberculosis.—The literature related to the rôle of constitutional fac-

tors in resistance to tuberculosis is extensively reviewed. Although the part played by hereditary factors in constitution is fundamental, and there is much evidence to show that these factors are of great importance in resistance to tuberculosis, environment is also important. Thus nutrition and the effects of disease may modify the constitution, often in ways similar to that in which heredity operates. The evidence for and against the effect of the various constitutional factors is presented from a clinical, epidemiological and experimental standpoint. A large literature provides no proof that skin character or body build is related to the course of tuberculosis. Biologic type seems to have some relationship; the "exudative diathesis" (a physiological body type with a ready inflammatory response to injury) appears to be associated with good resistance to tuberculosis. Many extensive studies of family lines to determine the effect of heredity on resistance have been made but the difficulties in ruling out environmental factors make many of the conclusions doubtful. Studies of identical and non-identical twins, however, suggest hereditary similarity in reaction, and comparisons of the resistance of litter mates of highly inbred laboratory animals have demonstrated many variations in different families of the same species which can be transmitted from generation to generation by successive brother and sister matings. Opinion as to the effect of mental disease such as schizophrenia on resistance to tuberculosis is divided, nor does there seem to be any convincing evidence that there is any relation between such resistance and blood groups. The rôle of race has been extensively studied. Differences in mortality rates of Negroes and whites seem in large measure to be the result of environmental differences, improvement in environment being associated with a continuous fall in the death rate in both races. Certain differences in the anatomical character of tuberculosis in Negro and white do exist, however, suggesting true hereditary differences. Although the Negro tends to respond with exudative lesions and massive lymph node caseation, some members of the race acquire the disease in highly chronic form, suggesting that the group is a mixed one, susceptible to natural selection which has had a shorter period in which to operate than has been the case with the white race. Epidemics in primitive populations, as in Indian communities, have also demonstrated this by destroying the highly susceptible individuals and permitting the survival of a group exhibiting the disease in a chronic form. The importance of age is illustrated by such facts as the more prolonged course of fatal disease in the later than in the earlier periods of life and the apparent relative resistance to tuberculosis of children in the age group from four to fourteen years. Varying periods of exposure seem necessary to effect a breakdown in the different age groups. Age also tends to select in an infected population by early removal of susceptible individuals. Sex appears to have some effect as evidenced by the fact that adolescent girls break down with tuberculosis more frequently than do boys of the same age in spite of less exposure. Evidence as to the effect of androgenic substances is conflicting, while pregnancy seems to affect tuberculosis not of itself so much as through the physical and economic stresses associated with it. Resistance to tuberculosis is reduced by malnutrition. Records suggest that protein deficiency was largely responsible for the high incidence of the disease in the late years of the first World War. Deficiency of vitamins A and C may further reduce resistance, but there is no decisive evidence as to the effect of vitamin D. Diseases such as silicosis, diabetes and possibly lymphogranulomatosis are associated with reduced resistance. Susceptibility may also be increased by leprosy, while those diseases which diminish allergy, such as measles, may increase it temporarily. Malaria, cancer, syphilis and leukaemia have no definite effect, whereas hyperthyroidism, mitral disease with pulmonary congestion, and arteriolar hypertension seem to be associated with increased resistance.—*Constitution and Related Factors in Resistance to Tuberculosis, E. R. Long, Arch. Path., July,*

1941, 32: 122; August, 1941, 32: 286.—(D. G. F.)

Early Diagnosis of Pulmonary Tuberculosis.—Only in a small percentage of tuberculosis cases is an early diagnosis made. Symptoms of early tuberculosis are so scarce that the patient usually does not seek the advice of the doctor. Mass miniature radiography, which is comparatively inexpensive, seems to be the best method to discover early cases. Such examinations were done in the personnel of R. A. F. and W. A. A. F., who had been found healthy on previous physical examination. Among 30,130 males examined, 65 (0.22 per cent) showed active tuberculosis, 108 (0.36 per cent) showed inactive tuberculosis. The extent of lung involvement was stage I in 35 men (54 per cent), stage II in 21 men (33 per cent), stage III in 9 men (13 per cent). Tuberculous pleural effusion was seen in 4 cases; old tuberculous pleurisy in 3 cases; calcified nodules, calcified lymph nodes or both in 275 cases (0.93 per cent). Among 9,989 women examined, 38 (0.38 per cent) showed active tuberculosis, 56 (0.56 per cent) showed inactive tuberculosis. The extent of lung involvement was stage I in 18 women (47 per cent), stage II in 18 women (47 per cent), stage III in 2 women (6 per cent). Tuberculous effusion was seen in one case; calcified nodules, calcified lymph nodes or both in 124 cases (1.2 per cent). The incidence in the age group twenty to twenty-four years was 0.35 per cent for men and 0.44 per cent for women, under twenty years 0.16 per cent for men and 0.39 per cent for women.—*The Early Diagnosis of Pulmonary Tuberculosis, R. R. Trail, The Varrier-Jones Memorial Lectures, September 25, 1942.*—(*G. C. L.*)

Pregnancy in Tuberculous Women.—At one time pregnancy was advised as a curative or preventative measure. The pendulum then swung to the opposite extreme, therapeutic abortion being advised in all cases of tuberculosis discovered before the fifth month. With more recent procedures in the treatment of tuberculosis, more emphasis has been placed on the control of the tuberculosis itself. With this change in emphasis the authors began to question the necessity of aborting pregnant tuberculous women. Pregnancy is a physiological process for which woman was created and which normally is not harmful, and tuberculosis kills many young women in whom pregnancy does not exist. The patients reported fell into two groups: those with active tuberculosis and those with chronic arrested tuberculosis. The woman with active disease should have the treatment which would be used were pregnancy not present, especially after labor in order to prevent a spread of the disease after the stimulation of pregnancy is removed. The pregnancy, likewise, should receive very careful attention. Any condition other than tuberculosis which would warrant therapeutic abortion demands such procedure although tuberculosis is present. Women becoming pregnant after leaving the sanatorium should receive unusually careful prenatal care. In general the following is employed: bed-rest except for bathroom privileges during the last two to three months, strict bed-rest four to six weeks after delivery and then home after four to six weeks of gradually increasing exercise. None are permitted to nurse their babies which are continually kept in a separate ward. With these facts in mind only one abortion was advised since 1921. Since that time there were 8 premature deliveries and 96 full term deliveries in 86 tuberculous women, eighteen to thirty-nine years of age. Six of the 8 women having premature deliveries had far advanced disease and 4 died two weeks to eight months after delivery. Four would have died regardless of the pregnancy. One died four and one-half years after delivery. Three are living and well for eight years or over, all having had at least one normal pregnancy since discharge. Six of the babies were in the sixth or seventh month of gestation and all died. The other 2 are living and well. Of 86 women having 96 full term pregnancies, 82 have been followed up. Fifteen, or 18.3 per cent, are dead in contrast to 39.1 per cent of all women of the same age group discharged from the

sanatorium during the same period. Sixty-four women were delivered at the sanatorium. Six are still hospitalized, 53 were discharged and 5 were dead at the time of discharge. The death rate in this group is 7.8 per cent as compared with 20.45 per cent of deaths for all women fifteen to thirty-nine years of age discharged during this period. Seventy children were born of these 64 mothers delivered in the sanatorium. Four could not be traced, one was still born, 3 have died of nontuberculous conditions, 2 became tuberculin-positive while still in the preventorium and the remaining 60 are well and free from infection. The authors are unable to explain why the death rate of all women eighteen to thirty-nine years of age should be double the rate of the pregnant group. They do believe that, while the group reported is small, the length of time of the study gives it value and that tuberculosis is not necessarily an indication for therapeutic abortion.—*The Treatment of the Tuberculous Woman during Pregnancy, E. S. Mariette, L. M. Larson & J. C. Litzenberg, Am. J. M. Sc., June, 1942, **203:** 866.*—(*G. F. M.*)

Gastroscopy in Pulmonary Tuberculosis.—Tuberculous enteritis is a common complication of cavernous tuberculosis but tuberculosis of the stomach is rarely found. Cullen was able to find only 4 cases of tuberculosis of the stomach in 1,043 autopsies. However, he found gastric symptoms are present in 29.3 per cent of tuberculous patients. These consist of anorexia, pain, nausea, vomiting and belching. Recently Renander reported 2 cases of proved tuberculosis of the stomach and reviewed cases reported in the literature. The majority develop on the basis of haematogenous dissemination to the stomach wall or adjacent structures. There are no characteristic roentgen findings, although the disease may cause pyloric stenosis and may resemble infiltrative neoplasms as well as polypoid gastritis. No gastroscopic observations in tuberculous patients have been reported. Twenty-seven patients so studied are reported. No specific lesion was found, although 5 patients had tuberculous enteritis. Chronic superficial gastritis was found alone in 7, chronic atropic gastritis in 3 and a combination of these lesions occurred in 10 patients. There was no apparent correlation between the duration, severity or type of tuberculosis or the quantity of sputum expectorated. A normal mucosa was found in the 5 patients who had no gastric complaints other than anorexia. While only 9 of 21 patients in whom an abnormal mucosa was observed had digestive symptoms, all patients had scant fasting gastric contents, free hydrochloric acid being found in only 7 cases. Cullen reported 21.7 per cent having digestive symptoms without specific gastrointestinal lesions. This relationship corresponds to the authors' observations and nonspecific gastritis may therefore have been present in this portion of Cullen's series. The failure of patients to have symptoms with gastric lesions may be due to bed-rest, low consumption of food and the frequent absence of free hydrochloric acid in the fasting specimen.—*Gastroscopic Observations in Pulmonary Tuberculosis, J. Flexner & O. Baum, Am. J. M. Sc., July, 1942, **204:** 101.*—(*G. F. M.*)

Gastric Acidity in Pulmonary Tuberculosis.—Studies of the gastric acidity were done in 325 patients with all forms of pulmonary tuberculosis. The test-meal consisted of 100 cc. of 7 per cent alcohol; samples were taken every fifteen minutes for one and one-half hours. Of 24 patients with minimal tuberculosis 16 per cent had achlorhydria, 8 per cent hypoacidity, 50 per cent normal acidity, 25 per cent hyperacidity. In 52 patients with moderately advanced tuberculosis the respective figures were 6 per cent, 17 per cent, 46 per cent, 30 per cent; in 206 patients with far advanced tuberculosis, 24 per cent, 23 per cent, 30 per cent and 21 per cent; in 42 far advanced cases complicated by amyloidosis, 35 per cent, 15 per cent, 41 per cent, and 9 per cent. Significant fever caused an increase in the incidence of achlorhydria. Anaemia *per se* did not affect the degree of acidity. There was no increased latent period in the

secretion of acid, the gastric response following a normal pattern. Roentgen examinations of the gastrointestinal tract were performed in 226 patients. Of 103 cases that showed roentgen evidence of intestinal tuberculosis, 21 per cent had achlorhydria; of the 123 normal cases, 22 per cent. The incidence of achlorhydria was twice as great among the female patients as it was among the male patients.—*Gastric Acidity in Pulmonary Tuberculosis, A. L. Kruger, Am. J. Digest. Dis., March, 1943, 10: 111.*—(*G. C. L.*)

Lung Puncture in Tuberculosis.—This is an extension of a previous study for the treatment of pulmonary tuberculosis by lung puncture. The present series consists of more than 1,000 cases. By puncturing the nucleus of the post-allergic focal infection, antibodies which had hitherto been confined are liberated into the circulation. By stereoscopic roentgenograms it has been found that the nucleus in the lung is sometimes star-shaped and sometimes like a wheel. The ordinary roentgenogram will often reveal the nucleus but best results are noted with stereoscopic films. The nucleus always lies close to the visceral pleura and in a remarkably constant position in the right lung. Its exact position for each sex and the technique for puncturing the nucleus are described. The procedure is harmless and is usually well tolerated. Mild dyspnoea, shivering, fever and pain are some of the post-operative complaints. Beneficial results were noted in 60 to 70 per cent of cases of pulmonary tuberculosis without cavitation and in 40 to 50 per cent of cases with cavities. Tuberculous lesions in other parts of the body may be similarly benefited by puncture of their respective nuclei. If the beneficial effects of the original puncture are not maintained the procedure can be repeated, though, in most cases, one puncture is sufficient.—*Treatment of Pulmonary Tuberculosis by Lung Puncture, C. R. Lavalle, Lancet, November 14, 1942, 2: 573.*—(*J. B.*)

Serum Proteins in Sarcoidosis.—It is a well established fact that cases of Boeck's sarcoid usually exhibit an elevation of serum globulin; in fact this feature of the disease is considered an important point in its diagnosis. The present paper reports an attempt to determine what part of the globulin fraction is increased, whether this increase is in any way specific for sarcoid and whether or not the alterations in the serum proteins can be correlated with the activity of the disease. The study deals with 12 well established cases of sarcoid in various stages of the disease and includes observations on 3 normal controls. Blood serum electrophoretic analyses were performed by means of the Longsworth modification of the apparatus of Tiselius. Results are arranged in tabular form. The patients with active lesions were found to have a marked elevation of the gamma globulin at the expense of the albumen, frequently with moderate hyperproteinaemia, the globulin being more consistently elevated than the total protein concentration. In 7 of the 8 active cases the elevation of the gamma globulin took place solely at the expense of the albumen, alpha and beta globulins being normal. Of the 4 inactive cases, one was found to have normal quantities of gamma globulin and the other 3 showed very little elevation. In 3 of the inactive cases, however, there was a slight elevation of the alpha globulin which was not noted in most of the active cases. Attention is called to the fact that the production of immune serum to a variety of antigens may lead to a marked increase in the gamma globulin of the blood or sometimes to the appearance of a new peak in a position intermediate between beta and gamma globulin. It has been demonstrated by actual separation of the material and by precipitation by the specific antigen that the antibody resides in this elevated globulin fraction. In sarcoid the electrophoretic pattern is similar to that observed in association with the formation of antibodies in response to an infectious agent. In comparison with tuberculosis sarcoid appears to be more prone to produce hyperglobulinaemia and hyperproteinaemia. In the few cases of tuberculosis reported the elevation of gamma globulin was not as great

as in sarcoid and the total proteins were usually normal. In the authors' cases of sarcoid in which healing had taken place and in which all clinical signs of activity had disappeared, almost normal patterns with only slight decreases of albumen and slight elevation of alpha globulin were found.—*The Serum Proteins in Sarcoid: Electrophoretic Studies, A. M. Fisher & B. D. Davis, Bull. Johns Hopkins Hosp., December, 1942, 71: 364.*—(*J. S. W.*)

Promin in Tuberculosis.—Following the excellent reports for promin in guinea pig tuberculosis, the authors decided that promin might be exploited in the treatment of accessible nonpulmonary lesions, to which effective concentrations might be applied locally without producing a toxic blood level. The high solubility and rapid absorption of promin indicated that the maintenance of an effective concentration in the lesion might require frequent application of strong solutions unless the drug were incorporated in a medium which would limit diffiusion. For this purpose a smooth jelly consisting of 5 per cent promin in a tragacanth base was used. The authors report on 10 cases in which this was used—in 5 closed tuberculous abscesses and in 5 open tuberculous sinuses. In the 5 closed cases the cold abscesses were resolved rather soon after treatment—much sooner than with conservative measures previously used. The lesions were not completely sterilized however. The 5 open sinuses—some having a fairly long history of drainage—responded well to the treatment. One sinus was completely healed and the others closed down to small openings with only slight drainage. In 2 cases there was a rise of temperature on the day after treatment—no other toxic reactions were noted. The authors believe that while the results were somewhat irregular the clinical opinion is that the improvement in all was greater or more rapid than would have been expected by orthodox methods applicable. In one case especially the results were spectacular, in that three different abscesses each healed completely within two weeks of starting treatment leaving only small fibrous residues.—*Treatment of Superficial Tuberculous Lesions by Local Application of Promin, W. H. Tytler & A. D. Lapp, Brit. M. J., December 26, 1942, 2: 748.*—(*D. H. C.*)

Sulfanilamide in Pleural Cavity.—Sulfanilamide in doses of 2 to 15 g. was used locally in the pleural space in 23 patients in whom intrapleural surgery was done. Lobectomy for lobar suppuration was performed in 16 patients, pneumonectomy in 4, excision of a mediastinal dermoid in one, excision of a dermoid with upper lobe amputation in one and a lingulectomy for bronchiectasis in one. Care was taken to dust the crystals well over the bronchial stump and to cover the dependent posterior gutter. All lobectomy cases received primary intercostal drainage and the tubes were clamped for six to twenty-four hours postoperatively to insure a high local concentration of the drug. Of the 23 patients, 8 in whom the bronchus remained completely and permanently closed did not develop empyema. The remaining 15, all of whom had transient or persistent open bronchi, developed putrid empyema. It is felt that the local use of the drug is indicated in those cases in which the bronchus has been well secured and contamination of the pleura has been rather extensive; in these cases the drug provides a bacteriostatic medium which can keep the contaminants under control until the defense processes can recover. Values of more than 200 mg. per cent of the drug were found in the pleural fluid during the first twenty-four hours. The drug was absorbed rapidly reaching a peak in the first twenty-four hours; blood concentrations over 10 mg. per cent were common and the highest value attained was 16.6 mg. per cent. No ill effects were observed from the administration of the drug.—*The Local Use of Sulfanilamide in the Pleural Cavity, T. H. Burford & E. A. Graham, J. Thoracic Surg., December, 1941, 11: 203.*—(*D. G. F.*)

Sulfonamides in Pleural Cavity.—The effect of the intrapleural administration of 4-gram doses of sulfanilamide, sulfapyridine, sulfathiazole and sulfanilylguanidine together with a combination of equal parts of each of these four drugs in the prevention of infection in the pleural cavities of dogs was investigated. The pleural cavities of 5 dogs were implanted with each drug and the combination of drugs respectively and the wounds were closed tightly. None of this group showed any unusual reaction as a result and, when autopsied after three weeks, showed only extensive adhesions between the pleural surfaces. Four groups of 6 dogs each were injected intrapleurally with 2 cc. of pus obtained from clinical cases of putrid empyema following resection of the lung for suppurative disease. One dog in each group was left untreated as a control. The remaining 5 received implantations of one of the four drugs and the combination of each of them, respectively. The control dog in each case died of empyema within eleven days. None of the treated dogs died of empyema and an autopsy after three to four weeks showed only extensive pleural adhesions comparable to those seen in the uninfected group. The conditions under which these experiments were performed were not comparable with those present after pulmonary resection for suppuration, a fact which may account for the less satisfactory results obtained after the clinical use of similar procedures, especially where a continued source of infection, such as from a leaking bronchial stump, is present. These measures, however, should be effective in controlling infection following intrathoracic operations in which there is no continued source of contamination. The adhesion forming properties of the drugs in this group may make indiscriminate use of them in the abdomen undesirable; they may, however, prove useful in the deliberate production of pleural adhesions.—*Experimental Observations on the Use of Drugs of the Sulfonamide Group in the Pleural Space, E. M. Kent & E. A. Graham, J. Thoracic Surg., December, 1941, 11: 198.*—(*D. G. F.*)

Contralateral Pleurisy.—The authors observed 10 cases of contralateral pleurisy with serofibrinous exudate in 7 instances and with serosanguineous in 3 cases. Six cases were associated with artificial intrapleural pneumothorax, 2 with thoracoplasty, one with phrenicectomy and one with extrapleural artificial pneumothorax. Seven patients had a bilateral pulmonary tuberculosis and 3 unilateral lesions. In 6 cases the effusion was on the left and in 4 on the right side. The authors feel that in all cases the aetiology of the contralateral pleurisy is tuberculous and in 2 cases tuberculous pachypleuritis was found although the fluid failed to present tubercle bacilli on culture. The pathogenesis in these cases probably is the presence of a cortical or subpleural focus which, evident or not, becomes activated at one time or another. The clinical symptomatology is clear cut and in some cases alarming. The evolution was not favorable in 5 cases and favorable in 5. The prognosis was based on two factors, the physico-chemical characteristics of the fluid and the extent of the parenchymal lesions. The therapy is limited to thoracocentesis if mechanical factors make it advisable or to pneumo-serosa in cases of permanent collapse therapy. In the cases of temporary collapse therapy careful reinsuflations are done in order to guarantee enough haematosis and not to impair the vital capacity. Symptomatic treatment and adequate diet should be prescribed with the patient favorably put in Fowler's position.—*Pleuresias exudativas contralaterales, C. Varela Figueral & J. Diaz Garteiz, Rev. de tuberc. d. Cuba, September, 1942, 6: 89.*—(*F. G. K.*)

Bronchial Obstruction in Tuberculosis.—Bronchial obstruction may be due to tracheobronchial tuberculosis as a result of submucosal tuberculosis proliferation or the formation of scar-tissue. The clinical history correlated with laboratory and roentgenographic findings may lead to a correct presumptive impression but the final diagnosis must rest upon bronchoscopic study with biopsy or smear of the lesion. A short

abstract of 15 interesting examples of bronchial obstruction is included.—*Bronchial Obstruction and Tracheobronchial Tuberculosis, E. B. Benedict, New England J. Med., December 31, 1942, 227: 1013.*—(*J. B.*)

Tuberculous Bronchitis.—A study was made of 100 cases of endobronchial disease of the trachea or major bronchi complicating pulmonary tuberculosis. Endobronchial tuberculosis is essentially a problem of mechanical obstruction. In the acute phase improper drainage of the diseased area is caused by a reduction in bronchial peristalsis, a loss of ciliary action and narrowing of the lumen by granuloma or exudate. In the chronic phase where the mucosa is smooth and intact there is either localized weakening of the cartilage resulting in excessive bronchial wall mobility so that the walls collapse into a narrow slit on expiration or inelastic stricture in which the lumen is only slightly influenced by respiration. Decrease in respiratory function as the result of the obstruction caused by endobronchial tuberculosis is proportional to the location of the involved bronchus and the degree and duration of the obstruction. Atelectasis and bronchiectasis resulting from retained secretions contribute to this decreased function and obstructive emphysema is present in all cases in varying degree, becoming of greater significance when the obstruction is greater. Therapy should be one step ahead of these irreversible complications caused by interference with the cleansing mechanism of the lung by the stenosis. Early bronchoscopic recognition of the disease and reduction of the size of the pulmonary bed before chronic stenosis and irreversible complications occur are of fundamental importance in treating the condition. Topical applications of silver nitrate have resulted in improvement, in many cases resulting in better bronchial drainage and reduction in the vascularity of the granulation tissue. Pneumothorax has given poor results. Of 22 cases so treated, one-third are dead, one-third unchanged or worse and only one-third improved or apparently arrested. Pneumothorax, particularly when ineffective, encourages complications. External drainage of the pulmonary cavity may occasionally be necessary and may control the bronchial lesion. Lobectomy or pneumonectomy may be indicated in selected cases. The most effective treatment was found to be thoracoplasty which controls the pulmonary lesion in the majority of cases, reduces the size of the pulmonary bed to a minimum and eliminates pleural complications. In a group of 25 cases there were no deaths, 12 per cent were unchanged or worse and 88 per cent were improved or apparently arrested.—*Treatment of Endobronchial Tuberculosis: A Review of 100 Cases, J. M. Chamberlain & J. Gordon, J. Thoracic Surg., February, 1942, 11: 292.*—(*D. G. F.*)

Tuberculous Tracheobronchitis. — This study is based on 500 autopsies of tuberculous patients at the Sea View Hospital. During this study the trachea and major bronchi were examined grossly and microscopically. Tuberculous lesions of the trachea or bronchi were found to occur more frequently in males than in females and most frequently in the decade from twenty-one to thirty years of age. In all races the incidence of tuberculous tracheobronchitis was found to be 35.4 per cent of those patients who died with tuberculosis. Tuberculous ulcers and miliary tubercles are the lesions most commonly found. These occurred most frequently in the posterior or posterolateral walls and chiefly in the lower portions of the trachea and the adjacent portions of the major bronchi. Sputum containing acid-fast bacilli was present in all but 22 of 356 patients with tracheobronchial tuberculous lesions. The greatest incidence of tuberculous tracheobronchitis was in patients with chronic fibroid tuberculosis of two to five years' duration. It is believed that the portal of entry of tubercle bacilli to the airways is through the mucous glands of the trachea and bronchi via their openings into the lumen. From here the infection may extend by continuity along the submucosal portions of the bronchus. The gross lesions observed were: (*1*) ulcers, (*2*)

granulomata, and (3) tuberculomata. The ulcer is usually circular or oval, rather shallow with indefinite irregular edges which may be either sharply demarcated or may blend into apparently normal tissue. Minute tubercles are usually seen along the edges and in the base of the ulcer. These tubercles caseate and liquify thus enlarging the ulcer. Secondary infection and necrosis may occur. Generally the ulcer is single. The granuloma is characterized by narrowing of the lumen of the air passage. The tuberculoma is generally single and firmly attached to the mucosa and is most frequently found in the upper portion of the trachea. Fibroblastic proliferation significant of healing may begin simultaneously with the development of the tubercle. Complete healing results in the formation of scar tissue which causes a certain amount of distortion of the bronchial lumen and may result in a narrowing of the involved portion. Acute and chronic nonspecific inflammatory changes were found often along with the tuberculous changes.—*Tuberculosis of the Trachea and Major Bronchi, Gertrude H. Wilber, Quart. Bull. Sea View Hosp., October, 1942, 7: 361.*—(*A. A. E.*)

Haematogenous Laryngeal Tuberculosis.—Three routes have been accepted to explain laryngeal tuberculosis in the presence of pulmonary tuberculosis: the lymphogenous, haematogenous and bronchogenic spread. It has not yet been properly proved that the larynx may be involved by way of the lymphatics. The author's observations seem to indicate that bronchogenic infection has been rather exaggerated because his statistics show only 33.3 per cent of tuberculous laryngitis with a positive sputum, while 26.9 per cent was observed in cases with negative sputum. In cases of closed pulmonary tuberculosis the bronchial route cannot be accepted. Even in open cases of pulmonary tuberculosis the infection may spread to the larynx as well as to other organs by the haematogenous route. Bronchogenic spread usually causes lesions of the glottis, anterior commissure, vocal cords and posterior laryngeal wall. These lesions are usually ulcerative. Lesions supposedly caused by the haematogenous route involve the supraglottic area, ventricular bands and the epiglottic and aryepiglottic folds. In these cases the epithelium does not succumb even in advanced lesions. The prognosis of haematogenous laryngeal tuberculosis varies. Sometimes the spread of the infection is small with only slight congestion and infiltration of the arytenoids, epiglottic and vocal cords. Healing usually goes hand in hand with the pulmonary lesion. In other cases progressive, deep ulcerations occur of which the author has observed occasional healing. This leads either to fibrous encapsulation and scar tissue around the ulcer or to epithelial proliferation at the site of the ulcer. —*Sindrome hematogeno de la tuberculosis laringea, M. Rodriguez, Rev. otorrinolaring., Valparaiso, Chile, June, 1942, 2: 9.*—(*F. G. K.*)

Tuberculous Laryngitis.—A study of the clinical records of 1,800 patients at the White Haven Sanatorium revealed that in 26 cases, or 1.5 per cent, symptoms of laryngeal involvement antedated pulmonary or systemic symptoms. In the great majority of cases the symptoms of hoarseness or sore throat so predominated the clinical picture that much valuable therapeutic time was lost before the pulmonary lesion was found. Of the 26 cases, 16 had hoarseness at the time of admission, 4 complained of sore throat and 6 had both symptoms. The average duration of laryngeal symptoms from onset to admission to the sanatorium for treatment of pulmonary tuberculosis was six months. The sputum of 21 was positive and of 5 negative. Patients were observed over a seven-year period, and 73 per cent had died while 27 per cent are classified as apparently cured. Only one of the latter group had clinically a severe grade of toxaemia. Adequate treatment was begun in 6 of the 7 cases of apparent cure two months earlier than in the 19 patients who died. An appreciation of the pulmonary status of the patient is essential in the management of laryngeal tuberculosis. Of this series, 12

were moderately advanced and 14 far advanced. It is evident therefore that laryngitis is not a sign of early tuberculosis. Only one of these patients had miliary tuberculosis. The author believes that the prognosis is definitely better when only the interior of the larynx is involved and when the patient has the exudative type of pulmonary involvement, since of the 7 apparently cured patients, all had intrinsic laryngeal lesions and 5 had exudative pulmonary disease. The author stresses the importance of roentgen studies of the lungs and sputum examination to rule out pulmonary tuberculosis when there is the least doubt as to the aetiology of definite chronic lesion anywhere in the larynx.—*Pulmonary Tuberculosis Masquerading as Laryngitis, J. C. Donnelly, J. A. M. A., October 31, 1942, 120: 675.*—(*G. L. L.*)

Primary Tuberculosis of Tonsils.—A patient's condition with dysphagia for two months became worse until the patient was unable to swallow even his own saliva. Oral examination showed an almost complete destruction of the left tonsil and partial ulceration of the anterior and posterior pillars of the same side surrounded by fibrous induration. Microscopical examination revealed tuberculosis of the tonsils, notwithstanding the fact that no further tuberculous lesion could be found elsewhere, such as lungs, intestinal tract or lymph nodes. Thus the diagnosis was primary tonsillar tuberculosis. The lesion healed well by surgical removal and ultraviolet radiation within two months following onset of symptoms.—*Sobre un caso de tuberculosis primitiva de la amigdala, C. M. Mirande, Rev. otorrinolaring., Valparaiso, Chile, March, 1942, 1: 91.*—(*F. G. K.*)

Tuberculosis of Stomach.—The diagnosis of tuberculosis of the stomach can hardly be made, as there is no specific symptomatology and no pathognomonic physical findings. In animal experiments it was shown that: (*a*) acidity and stasis had no significance for the development of gastric tuberculosis; (*b*) the fundal and cardiac pouches were not susceptible; (*c*) in the pyloric pouch histological changes were produced by submucosal implantation and by haematogenous routes after injection of tubercle bacilli into the gastro-epiploic artery. Of 1,321 patients who died from tuberculosis, 30 (0.22 per cent) showed gastric tuberculosis on necropsy. Fifty Negroes with bilateral pulmonary tuberculosis were gastroscoped. Normal mucosa was found in 19 (34 per cent), atrophic gastritis in 12 (24 per cent), superficial gastritis in 11 (22 per cent), ulcers in 8 (16 per cent).—*Gastric Mucosal Changes of Tuberculosis, D. C. Browne, G. McHardy & C. Wilen, Am. J. Digest. Dis., December, 1942, 9: 407.*—(*G. C. L.*)

Surgery in Intestinal Tuberculosis.—The author presents his experience obtained during three years of intestinal surgery for tuberculosis in his service of phthisiogastro-enterology at the Sanitarium Hospital "La Esperanza," Havana, Cuba. The author had been performing the so-called short-circuit type of operation, that is, the left ileo-transversostomy. The rather unfavorable results have made him choose the radical subtotal right hemi-colectomy which he has been practicing ever since. From postmortem studies and from careful regular examinations of the physio-pathological condition of the patients following operation the author concludes that in ileo-transversostomy a permanent rest of the excluded intestinal segment must not be expected and that in certain cases this operation results in cecal stasis lasting several days. The lesions of the ascending colon do not always heal after surgical exclusion. Whether they heal or not the results are usually bad with partial occlusion or microabscesses and repeated haemorrhages. Frequently after derivative surgery new tuberculous lesions appear and those already existing can recover at any moment their primitive virulence since the patient is in no way protected from recurrence. The short circuit operation does not alter the preëxisting condition a great deal. In the presence of pulmonary tuberculosis the intestinal lesions

remain and so do their blood supply and lymphatic system. Ileo-transversostomy, therefore, should not be the final surgical decision in the treatment of secondary intestinal tuberculosis of the ileo-caecal junction and, furthermore, it should not be the final stage of any surgical treatment of this intestinal lesion unless powerful reasons existing should make the radical operation impossible.—*Nuestro concepto de la cirurgiaconservadora de colon en el tratamiento de la tuberculosis intestinal secondaria, H. M. Escobar, Rev. de tuberc. d. Cuba, September, 1942, 6: 3.*—(*F. G. K.*)

Constrictive Pericarditis. — Thirty-seven cases of constrictive pericarditis have been studied In these individuals the diagnosis was made clinically and confirmed in all but a few by operation or by postmortem examination. The ages of the patients ranged from ten to fifty-nine years. There were 25 males and 12 females. The aetiology was determined to be tuberculosis in 5, sepsis in one, pneumonia with polyserositis in 2 and unknown or questionable in 29. Nineteen (54 per cent) of the patients had enlarged heart areas. In 16 (43 per cent) calcification of the pericardium was demonstrated. The electrocardiogram was abnormal in every case; low voltage of the QRS waves was found in 22 cases (60 per cent) and abnormal T-waves of two or three leads were found in all cases. Twenty-eight of the 37 patients have had pericardial resection. Of these 14 were clinically cured, although in a few cases slight increase in venous pressure persisted and one of the 14 died of pneumococcus pleurisy one year postoperatively. Three others were much improved by the operation. Two of those treated by operation died primarily of the disease itself, one of tuberculosis and one of congestive heart failure four months postoperatively. In 5 the death was directly attributed to the operation. All of these died within a week after the operation. Four died of other complications. Nine cases did not have pericardial resection; in 3 of these the symptoms were so mild that operation was not thought necessary; 3 were too sick to undergo operation; one died of miliary tuberculosis before operation could be carried out and 2 others died before the operative approach had been developed.—*Chronic Constrictive Pericarditis: A Follow-up Study of Thirty-Seven Cases, M. B. Harrison & P. D. White, Ann. Int. Med., November, 1942, 17: 790.*—(*A. A. E.*)

Tuberculous Endocarditis.—In a seventeen year old colored man, who suffered from increasing dyspnoea, the diagnosis of active rheumatic heart disease with valvulitis, endocarditis, myocarditis and pericarditis with effusion was made. History, physical examination and laboratory data were compatible with this diagnosis. At autopsy the gross and histological examination revealed a caseous tuberculosis of the heart valves and of the endocardium. Acid-fast bacilli were found in the valves.—*Tuberculous Endocarditis, Margaret Bevans & S. A. Wilkins, Am. Heart J., December, 1942, 24: 843.*—(*G. C. L.*)

Calcified Tuberculoma of Brain.—Calcified tuberculoma of the brain is rare. Only one case was encountered in the authors' collection of over 1,400 verified brain tumors. The patient, a colored boy, fifteen years of age, had had repeated convulsive attacks and lower extremity weakness for ten years. Roentgen examination of the skull showed a well localized spongy type of calcification in the right parieto-occipital region beneath the dura. A chest roentgenogram showed a large calcified lymph node in the right hilum. In view of the long history and roentgen findings, a diagnosis of calcified tuberculoma was made and verified at operation. The patient is alive and well at the time of the writing almost a year after the operation. Intracranial tuberculomata are always haematogenous in origin. In general they tend to occur in persons who have only one extracranial tuberculous focus. They have a predilection for the cortex of the cerebrum or the cerebellum. In the cerebellum the tuberculoma is apt to be in contact with the infoldings of the pia in the folia, and meningitis usually occurs before the lesion

can become calcified. In the cerebral cortex the focus of caseation is accompanied by proliferation of connective tissue at its periphery. The connective tissue may become very thick and hyalinized. The deposition of calcium usually occurs at the junction of the necrotic and connective tissue zones. Gradually the necrotic core is completely encased within a thin shell of calcium which in turn is surrounded by a wall of dense connective tissue. Over a great period of time the calcareous shell may also become quite thick and the necrotic core transformed into a crumbly chalk-like material. The thin calcareous shell, if subjected to the compression of the shrinking and contracting outer connective tissue zone, is usually fractured in some degree. An irregularly broken calcareous shell does not occur in any other intracranial tumefaction. The roentgen appearance of the lesion varies with the degree of thickness of the calcareous shell and the extent to which it has been fractured. When the contour is not greatly disturbed, the lesion appears dense and somewhat irregular with crenated or indented margins. In some instances the periphery of the shell may be badly battered and small pieces may be broken off. A roentgenogram in one plane will show an irregular dense shadow surrounded by a halo of spicules or tenuous strands. Roentgenograms of the authors' case and those of 6 other cases reported in the literature illustrate the variability of the findings. In one roentgenogram dissimilar to the others, there were multiple interlacing circular shadows interpreted as representing calcification in the walls of a conglomerate tubercle composed of eight or nine separate tubercles. Since tuberculomata are commonly located in the cortex, the roentgenogram usually shows the lesion near the inner table of the skull. Because of the distribution of the cerebral cortex over the mesial aspect of the hemispheres and over the basal gyri, midline and basal calcareous shadows may represent tuberculomata. In a few instances two or three separate tuberculomata may be present instead of the usual single lesion. Though the peripheral zone of connective tissue may be quite thick, the calcified portions are not large. The largest tuberculoma is about the size of a walnut, the smallest, 2 or 3 mm. in diameter. Although the history of symptoms is long, ranging from four to sixty-one years in 13 cases, most of the patients have been under twenty years of age and frequently under twelve. Very few cases exhibit signs of increased intracranial pressure since tuberculomata are necrotizing lesions rather than expanding ones. Jacksonian convulsions are usually present, often the first symptom.—*Calcified Tuberculoma of the Brain, L. M. Weinberger & F. C. Grant, Am. J. Roentgenol., April, 1942, 47: 525.*—(*W. H. M.*)

Sacro-iliac Tuberculosis.—Forty-four cases of proved sacro-iliac tuberculosis have been studied. The diagnosis was established either by a positive biopsy or by typical destructive changes in the bones with a cold abscess overlying the joint or proved tuberculosis elsewhere. Among these 44 patients, 33 were male and 11 female. Thirteen had involvement of the right joint and 24 of the left joint and 7 had bilateral involvement. The most prominent local symptoms were pain and limp. The pain was usually aggravated by exertion and was rather sudden in onset. Customarily the pain subsided with the development of an abscess. Abscesses occurred over the sacroiliac joint in 11 cases. In 15 other cases the abscesses were located in neighboring regions. Roentgenographic evidence of bony changes in the sacro-iliac joint was found in every case. These changes were those of erosion, sclerosis and cavitation. The sacrum usually showed more apparent destruction than the ileum. In only 5 of the 44 cases was sacro-iliac disease the only lesion found. All others had extensive tuberculosis elsewhere in the body, usually pulmonary. It is believed that sacro-iliac tuberculosis is a manifestation of Pott's disease of the spine which has spread to the neighboring joint. Operative treatment has been found to give the best results. The method used is an arthrodesis of the sacro-iliac joint according to

the principle described by Smith-Petersen. Fourteen of the patients in this series were operated upon and 10 had immediate postoperative relief of pain. The mortality in conservatively treated cases was 73 per cent and in the operated cases it was 36 per cent.—*Sacro-iliac Tuberculosis, N. Pollack & D. M. Bosworth, Quart. Bull. Sea View Hosp., October, 1942, 7: 415.*—(*A. A. E.*)

Roentgen Therapy in Tuberculosis of Breast.—Tuberculosis of the breast occurs infrequently. It is usually unilateral. The disease usually occurs between the ages of twenty and forty. Over 50 per cent of the cases are clinically primary. The axillary lymph nodes likewise are involved in over 50 per cent of the cases. The disease may develop in the breast secondary to axillary lymph node involvement. The differential diagnosis from cancer of the breast may be impossible when ulceration and sinus formation have not yet occurred. Biopsy of the abscess wall is advisable in cases of breast abscesses which do not heal promptly under conventual therapy. Since local excision of the involved segment of the breast is reported to be unsuccessful in many cases, simple mastectomy must be done for cure. Roentgen therapy is recommended in tuberculosis of the breast as a conservative and successful form of treatment. A case of tuberculosis of the breast is presented which was treated with roentgen irradiation and is now free of disease for twenty-nine months since the last treatment.—*Tuberculosis of the Breast Treated with Roentgen Irradiation, S. Richman, Am. J. Roentgenol., May, 1942, 47: 771.*—(*W. H. M.*)

Nasopharyngeal Pseudotuberculosis. — Nine patients who because of their symptoms had been considered highly suspicious of pulmonary tuberculosis presented loss of weight, asthenia, anorexia, night sweats, slight fever, hoarseness, cough and mucopurulent, sometimes blood-streaked sputum. Roentgen examination and tuberculin tests were negative. Nose and pharynx examination showed chronic rhinopharyngitis. Pseudotuberculosis of the pharynx has been studied by M. du Magny in 1901 and since many contributions are reported in the literature, particularly during World War I when this syndrome was observed among army recruits. Every chronic infectious lesion of the nose or sinuses can give rise to pseudotuberculous complaints and the infection can reach the lungs through the lymphatics or along the air passages. Frequent dry or mucopurulent or decidedly haemoptoic expectoration which is due to congestion, asthenia, slight fever and other general signs are common to both diseases. Characteristic clinical and roentgenological signs of bronchosinusitis disease usually permit a sharp differential-diagnostic separation from pulmonary tuberculosis.—*Pseudotuberculosis pulmonares de origen nasofaringeo: Sindrome de Martin du Magny, A. L. Agucro, Rev. otorrinolaring., Santiago, Chile, June, 1942, 2: 61.*—(*F. G. K.*)

Bronchospirography.—Out of a series of more than 70 bronchospirographic examinations in about 60 patients, 5 patients in whom such examinations were performed before and after collapse therapy are presented. These cases illustrate some of the compensatory mechanisms that are called into play following such procedures, and which, within limitations, insure the maintenance of normal respiratory function. These mechanisms include a reduction in the reserve air, improved economy of respiration as indicated by a reduced ventilation equivalent (that is, the volume of ventilated air from which 100 cc. of oxygen is absorbed), and increased oxygen consumption by the contralateral lung. In only 4 of 29 patients who were studied before and after collapse measures were instituted was there a significant rise in the respiratory rate. The importance of the diaphragm in ventilation is suggested by these cases, since they include a case of thoracoplasty and permanent phrenicectomy, one of pneumoperitoneum, and one of thoracoplasty complicated by effusions. The effect of collapse measures may be to improve function by eliminating functionally dead space, to improve

oxygen consumption through a cardiovascular factor or to cause the contralateral lung to do more work in the form of an increased minute volume either through an increase in respiratory rate or tidal air.—*Bronchospirography. 2. Application to Collapse Therapy: Preliminary Report, G. Leiner, M. Pinner & W. A. Zavod, J. Thoracic Surg., October, 1940, 10: 32.*—(*D. G. F.*)

Bronchial Secretion.—The presence of pus or infected secretions in the lung and in the bronchi is the most important problem facing the anaesthetist in major surgery of the lungs. Handling of the tissues, pressure and the normal bronchial reflexes result in expulsion of secretions during the operation. These secretions tend to spill over into the rest of the lung but existing methods for their control are beset with technical difficulties. A new instrument and a new technique is described to overcome these difficulties.—*A Method of Controlling Bronchial Secretion in Thoracic Surgery, J. Halton, Lancet, January 2, 1943, 1: 12.*—(*J. B.*)

Pneumothorax and Contralateral Lung.—In 500 ambulant patients the effect of unilateral artificial pneumothorax on the contralateral lung was studied. The danger of a contralateral spread or exacerbation of a preëxisting lesion was greater in young adults (fifteen to twenty-four years) than in older adults (twenty-five to thirty-nine years), in Moslems than in Hindus, and in the cases with a history of contact than in those without it. The previously normal lung was affected more in males than in females, preëxisting lesions progressed more in females than in males. The danger of contralateral spread or exacerbation of the preëxisting lesions was found to be greater in cases with cavity in the artificial pneumothorax side than in those without it, and in cases with positive sputum than in those with negative sputum. The maximum hazard for the contralateral spread or exacerbation existed during the first year of treatment. The danger of contralateral spread or exacerbation diminishes with the effectiveness of the collapse. Preëxisting contralateral lesions more frequently progress in those with a definitely mobile mediastinum than in those with an almost fixed mediastinum. Out of 500 cases the contralateral lung before artificial pneumothorax was normal in 270 and was affected in 230. Among the normal lungs, 64 (23 per cent) developed lesions during treatment. In those cases in which a contralateral lesion existed before the induction of pneumothorax such lesions improved in 77 (33.5 per cent), remained stationary in 90 (39.1 per cent) and progressed in 63 (27.4 per cent).—*Behaviour of the Contralateral Lung in Ambulatory Cases under Unilateral Pneumothorax Treatment (A Record of 500 Cases), P. K. Sen & K. N. De, Indian M. Gaz., October, 1942, 77: 605.*—(*G. C. L.*)

Extrapleural Pneumothorax.—The author is cognizant of the fact that extrapleural pneumothorax has been severely criticized during the past few years. He feels that if indications are strictly adhered to the operation deserves a prominent place in collapse therapy. The procedure is advocated for unilateral active progressive tuberculosis with or without fever, for active cavitary tuberculosis of mixed exudative productive character and for chronic fibrotic cavitary disease without definite evidence of activity except for positive sputum. It is assumed that intrapleural pneumothorax has been found impossible in these cases. Another prominent field of application is previous or simultaneous collapse therapy on the other side. Statistics on an unselected group of 50 cases are presented. Four patients died. Forty patients were discharged with negative sputum, most of them able to engage in gainful occupation. Ten patients had undergone collapse therapy on the other side prior to operation. The most serious complication of the procedure is infection of the bloody exudate which frequently fills the extrapleural space following operation. Withdrawal of the exudate is advised because the excessive pressure in the space may disrupt the suture line. Secondary infection is treated with aspiration of fluid

and instillation of "Cibazol." Tuberculous empyemata are irrigated and filled with oil when dry. The tendency to bleeding will be diminished if careful attention is paid to the intercostal artery and the intercostal muscles at the time of closure. Extrapleural spaces show a tendency to obliterate rapidly if blood is permitted to remain, an additional indication for withdrawal of blood. To combat the tendency for obliteration, the space should be made larger than appears to be indicated from the preoperative X-ray film. Frequently it becomes necessary to fill the space with oil. This is also done if a permanent collapse is desired. The space is to be maintained for the same length of time as an intrapleural pneumothorax. The pressure of plus 32 plus 34 has been found optimal. This pressure is reached gradually during the first two weeks following operation. Refills more than two weeks apart are inadvisable as long as the space is to be maintained.—*Die Leistungsfähigkeit des extrapleuralen Pneumothorax, M. Arnold, Schweiz. med. Wchnschr., October 17, 1942, 72: 1144.*—(*H. M.*)

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